

REMARKS

1. Status of the Claims:

Claims 1-41 are pending in this application.

As indicated in the final Office Action mailed April 13, 2007, claims 2-5 and 13-41 are withdrawn from consideration and claims 1 and 6-12 are rejected.

2. Response under 35 CFR 1.116

In response to the final Office Action, reconsideration of the final rejection and amendment of the claims is requested

Previously present claim 1 and original 12 are proposed to be amended, and new claim 42 is added.

This response seeks to convince the Examiner to remove the rejection of the claims in the final Office action, or failing that to place the claims (as amended) in better form for appeal.

The response is being filed within two months of the mailing date of the final Office Action.

3. The proposed amendment to claims 1 and 12, and new claim 42 should be entered.

The proposed amendment to claim 1 does not raise any new issue that the Examiner has not already considered in regard to examination of the claim, and it is made for clarity purposes substantially without a material change in scope. See the "Response to Arguments" on pages 6-7 of the final Office Action.

Also, the proposed amendment to claim 1 places the amended claim in better form for appeal by clarifying the issues for an appeal in regard to the rejection of such claim in the final Office Action.

The proposed amendment to claim 12 is made for clarity purposes.

New claim 42 recites what is cancelled from claim 1 as proposed to be amended, i.e. the fluid drop steering device applying the energy "optionally" to the fluid inside of the fluid chamber.

Thus, the proposed amendments to claims 1 and 12, and new claim 42, do not raise any new issue that requires further examination and/or search and therefore they should be entered.

4. Claim Rejections – 35 U.S.C. § 102(b)

Claims 1 is rejected under 35 U.S.C. §102(b) as being anticipated by Hawkins (US '222).

Claim 1 as proposed to be amended is as follows.

1. (currently amended) A printhead comprising:
a fluid chamber having an orifice;
a fluid drop forming mechanism associated with the fluid chamber and being operable to apply to fluid present in the fluid chamber energy which is sufficient to cause a fluid drop to be ejected from the orifice; and
a fluid drop steering device associated with the fluid chamber and being operable when fluid is within the fluid chamber to optionally be able to apply to fluid inside of the fluid chamber energy which is insufficient to cause drop formation to fluid present in the fluid chamber ~~when fluid is within the fluid chamber~~, the fluid drop steering device being distinct from the fluid drop forming mechanism.

Hawkins does not disclose claim 1 as proposed to be amended since in Hawkins the fluid drop steering device (air tube 32) does not apply energy (air stream 34) to fluid inside of the fluid chamber (ink cavity 22).

The Examiner in rejecting claim 1 as being anticipated by Hawkins appears to conclude that the claimed fluid chamber is the ink cavity 22 in Hawkins, the claimed orifice is the nozzle 18 in Hawkins, and the claimed fluid drop steering device is the air tube 32 in Hawkins.

In Hawkins, the fluid drop steering device (air tube 32) does not apply energy (air stream 34) to fluid inside of the fluid chamber (ink cavity 22). Instead, as can be appreciated by viewing FIGS. 1b and 1c, the fluid drop steering device (air tube 32) applies energy (air stream 34) to the fluid drops (ink drops 26 and 28) outside of the fluid chamber (ink cavity 22).

As such, Hawkins does not disclose claim 1 as proposed to be amended since in Hawkins the fluid drop steering device (air tube 32) does not apply energy (air stream 34) to fluid inside of the fluid chamber (ink cavity 22).

Accordingly, the rejection of claim 1 as proposed to be amended is obviated and therefore should be withdrawn.

Hawkins does not disclose claim 1 as previously presented since in Hawkins the fluid drop forming mechanism (heating element 30) does not apply energy to fluid present in the fluid chamber (ink chamber 22).

The Examiner in rejecting claim 1 as being anticipated by Hawkins appears to conclude that the claimed fluid chamber is the ink cavity 22 in Hawkins, the claimed orifice is the nozzle 18 in Hawkins, and the claimed fluid drop forming mechanism is the heating element 30 in Hawkins.

In Hawkins, it is disclosed that the ink drops 16 ejected from the nozzle 18 are formed in a membrane 20 overlying (outside of) the ink cavity 22. Moreover, the drops 16 ejected from the nozzle 18 are sized into large drops 26 and small drops 28 by means of the heating element 30. See Hawkins at col. 5, lines 35-44. The heating element 30 circumscribes the nozzle 18 on an outside surface of the membrane 20 as shown in FIGS. 1b and 1c, and therefore is outside of the ink cavity 22.

As such, Hawkins does not disclose claim 1 as previously presented since in Hawkins the fluid drop forming mechanism (heating element 30) does not apply energy to fluid present in the fluid chamber (ink chamber 22). Instead, the fluid drop forming mechanism (heating element 30) applies energy to fluid (ejected ink drops 16) outside of the fluid chamber (ink chamber 22).

Accordingly, the rejection of claim 1 is obviated and therefore should be withdrawn.

Hawkins does not disclose claim 1 as previously presented, and new claim 42, since in Hawkins the fluid drop steering device (air tube 32) is not operable to optionally apply energy (air stream 34.)

In Hawkins, the fluid drop steering device (air tube 32) is not operable to optionally apply energy (air stream 34) to the ink drops 16. See Hawkins at col. 5, lines 38-47.

New claim 42 recites what is cancelled from claim 1 as proposed to be amended, i.e. the fluid drop steering device applying the energy optionally to the fluid inside of the fluid chamber.

Accordingly, the rejection of claim 1 as previously presented is not correct, and new claim 42 should be allowed.

5. Claim Rejections – 35 U.S.C. § 103(a)

Claims 6-8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hawkins. (US '222) in view of Anagnostopoulos et al. (US '595).

Claims 9-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hawkins (US '222) and Anagnostopoulos et al. (US '595) and further in view of Dante et al. (US '547).

Anagnostopoulos et al. does not disclose claim 7 as originally presented since in Anagnostopoulos et al. the heater (heater annulus 50) is not formed as a portion of a side wall of the fluid chamber (ink delivery channel 40 etched in substrate 42).

In Anagnostopoulos et al., the heater (heater annulus 50) is located on an outside surface of an insulating layer 68 as shown in FIG. 2A. The insulating layer 68 is not part of the sidewall (indicated in the drawing on page 4 of the final Office Action) of the fluid chamber (ink delivery channel 40 etched in substrate 42) since the insulating layer rests on top of the substrate forming the fluid chamber. Moreover, see Anagnostopoulos et al. at col. 4, lines 47-49, which states that the heater annulus 50 is separated from the substrate 42 by the insulating layer 56 to minimize heat loss to the substrate, i.e. to the ink delivery channel 40. Under the circumstances, how can the Examiner conclude that the heater (heater annulus 50) is formed as a portion of the side wall of the fluid chamber (ink delivery channel 40 etched in substrate 42) in FIG. 2A?

Anagnostopoulos et al. does not disclose claim 7 as previously presented since in Anagnostopoulos et al. the heater (heater annulus 50) is not formed as a portion of a sidewall of the fluid chamber (ink delivery channel 40 etched in substrate 42).

Accordingly, the rejection of claim 7 should be withdrawn.

Anagnostopoulos et al. does not disclose claim 7 in the context of claim 1 since in Anagnostopoulos et al. the fluid drop forming mechanism (heater annulus 50) does not apply energy to fluid present in the fluid chamber (ink delivery channel 40 or nozzle bore 46).

In Anagnostopoulos et al., the fluid drop forming mechanism (heater annulus 50) is located on an outside surface of an insulating layer 68 as shown in FIG. 2A. The insulating layer 68 rests on top of the fluid chamber (ink delivery channel 40 etched in substrate 42). Moreover, see Anagnostopoulos et al. at col.

4, lines 47-49, which states that the heater annulus 50 is separated from the substrate 42 by the insulating layer 56 to minimize heat loss to the substrate. Thus, in FIG. 2A the heater annulus 50 applies energy to the continuous ink stream 60 emerging from the fluid chamber (ink delivery channel 40 etched in substrate 42), not to ink within the fluid chamber.

As such, Anagnostopoulos et al. not disclose claim 7 in the context of claim 1 since in Anagnostopoulos et al. the fluid drop forming mechanism (heater annulus 50) does not apply energy to fluid present in the fluid chamber (ink delivery channel 40 or nozzle bore 46). Instead, Anagnostopoulos et al. discloses applying energy to fluid emerging from the fluid chamber.

Accordingly, the rejection of claim 7 should be withdrawn.

Dante cannot be combined with Hawkins as the Examiner has done.

In Hawkins, the fluid drop forming mechanism (heating element 30) applies energy to fluid (ejected ink drops 16) outside of the fluid chamber (ink chamber 22). This is necessary in order for the fluid drop forming mechanism (heating element 30) to size the drops 16 ejected from the nozzle 18 into large drops 26 and small drops 28. See Hawkins at col. 5, lines 35-44. .

In Dante, the fluid drop forming mechanism (heater 102 or 106) within the orifice (nozzle 116 or 120) leading from the fluid chamber (ink chamber 114) is operable to apply energy to fluid present in the orifice which is sufficient to cause a fluid drop (ink drop 632 or ink droplet 636) to be ejected from the orifice. See Dante at [0019] and [0021].

Thus, owing to the materially different functions of the fluid drop forming mechanism (heating element 30) in Hawkins and the fluid drop forming mechanism (heater 102 or 106) in Dante, one of ordinary skill in the art would not combine Dante with Hawkins as the Examiner has done. The respective functions of the fluid drop forming mechanism (heating element 30) in Hawkins and the fluid drop forming mechanism (heater 102 or 106) in Dante are at cross-purposes with one another.

The combination of Hawkins, Dante, and Anagnostopoulos et al. does not teach claim 1 as proposed to be amended.

In Dante, the fluid drop forming mechanism (heater 102 or 106) within the orifice (nozzle 116 or 120) leading from the fluid chamber (ink chamber 114) is operable to apply energy to fluid present in the orifice which is sufficient to cause

a fluid drop (ink drop 632 or ink droplet 636) to be ejected from the orifice, not to fluid within the fluid chamber as in claim 1. See Dante at [0019] and [0021].

In Anagnostopoulos et al. (FIG. 2A), the heater annulus 50 applies energy to the continuous ink stream 60 emerging from the fluid chamber (ink delivery channel 40 etched in substrate 42), not to fluid within the fluid chamber as in claim 1

In Hawkins, the fluid drop forming mechanism (heating element 30) applies energy to fluid (ejected ink drops 16) outside of the fluid chamber (ink chamber 22), not to fluid within the fluid chamber as in claim 1.

In Hawkins (FIGS. 1b and 1c), the fluid drop steering device (air tube 32) applies energy (air stream 34) to the fluid drops (ink drops 26 and 28) outside of the fluid chamber (ink cavity 22), not to fluid inside of the fluid chamber as in claim 1.

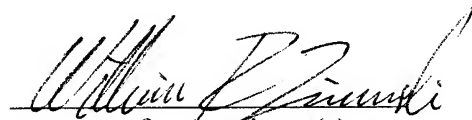
CONCLUSION

This response seeks to convince the Examiner to remove the final rejection, or failing that to place the claims (as amended) in better form for an appeal.

If the Examiner disagrees with any of the remarks presented above, to the extent that the claims would not be allowed, she is requested to respond to such remarks in order to best focus the issues for continued prosecution.

The Examiner is requested to call the undersigned Attorney for Applicant(s) in the event that a telephone interview will expedite prosecution of the application towards allowance or reduce the issues for purposes of an appeal. For example, any suggestion of the Examiner regarding amendment to the claims is welcomed.

Respectfully submitted,


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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.